A S Y R

Final Revision

On

"Cardio-thorax"

2016

(Scheme + Previous Essay Questions with Answers)

- Don't miss
  * MCQ Part

Dr / Amr Yakout

الورق جهدي من الشروق وانا مش
مسامح اي حد يهوره علي مكتبة
تانية او يرفعه علي النت بدون
سابق استئذان مني ..
A S Y R

Heart

operations on heart include:-

closed heart surgery (while heart is beating)

- closed mitral commissurotomy
- OFF pump Coronary artery bypass surgery (OPCAB)
- closure PDA
- correction of coarctation.

open heart surgery (Heart non-beating)

- valve replacement
- Repair congenital defects
- coronary surgery (on-pump)

Extra corporeal circulation (ECC)
Heart Lung machine
cardio Pulmonary bypass (CPB)

- D.f: machine ∴ replaces the function of heart (pumping) and Lung (oxygenation) during cardiac surge
- Components:
  1. Reservoir → Collect all returned venous blood
  2. oxygenator → oxygenating deoxygenated blood. It could be bubble or membr oxygenator.
  3. Roller-Pump → Push blood back to arch of aorta
  4. Heater-cooler → Cool down temp of pt during ByPass and warm him at end of bypass.
- Steps بالترتيب
  1. Mid sternotomy
  2. Heparin is added before Cannulation to prevent clotting inside canulae, tubes, oxygenator.
  3. cannulae inserted into aortic arch, IVC, SVC
  4. to Reservoir to collect all returned ----
  5. to oxygenator -----
  6. Roller-Pump ----
  7. Filters → Prevent passage of micro-emboli
  8. cooling pt to desired temp
  9. Aortic cross clamp → causing ischemia and force heart to Stop Beating.
  10. Cardioplegia
  11. Protamine sulfate is given to neutralize heparin at end of operation after removal of canulae from heart
- Indications:
  1. Coronary artery bypass surgery (CABG) ----------
  2. cardiac valve repair, replacement.
  3. Repair of large septal defects (ASD, VSD)
  4. Repair and Palliation of congenital heart defects as Fallot.
  5. Transplantation (Heart & Lung)
  6. Repair of some Large aneurysm (aortic, cerebral)
  7. Pulmonary thromboendarterectomy & thrombectomy
  8. life support for new borns ē serious birth defects.
  9. Induction of total body hypotherm
- complications:
  1. Brain → cerebral stroke, neurocognitive defect, Depression, Psychosis, obsession, sleep deprivation.
  2. Heart → M.I, Low CO ↓, stone heart ↓ dt bad myocardial preservation and arrhythmia.
  3. Lung → Atelectasis, ARDS, post perfusion Lung
  4. GIT → Paralytic ileus, stress ulcer, Acute pancreatitis
  5. Kidney → Renal insefficiency
  6. vascular → platelet dysfunction & immune suppression.
- Myocardial preservation by
  - (a) Coronary perfusion hypothermia to ↓ myocardial metabolism using cardioplegic solution contain K+ chlor infused into coronary ostia
  - (b) Local hypothermia by placing ice or cold saline on heart
  - (c) systemic hypothermia
    - mild → 32°C
    - moderate → 25°C
    - Severe → 20°C
    - Profound → 16-18°C total in case of extensive aortic aneurysm.

Hypothermia protects heart and all organs by ↓ metabolic needs and ↓ oxygen demand during procedure.

Coronary artery bypass graft: (CABG)

- It is Surgical treatment of coronary artery stenosis
  1- Left main stem coronary stenosis
  2- Three-vessels disease
  3- In stent stenosis or thrombosis after PCI
  4- Ischemic heart in diabetic patients
  5- Combined CABG and valve surgery

may be done on-pump (FCC) or off pump

1- Internal mammary artery bypass "Best conduit it long term patency & secrete nitric oxide"
2- Saphenous vein graft bypass "most common used for revascularization of many diseased vessels" it it's lengthy
3- Radial artery bypass

Types of prosthetic cardiac valves

Mechanical valve	Tissue valve
ⓐ Types 1- cage ball valve (starr-Edwards) 2- mono leaflet valve (medtronic) 3- Bileaflet valve (carbomedics)	ⓐ Types 1- Autograft (excision of native pul-valve and implanting it in aortic position of same pt) 2- Homograft (Human cadaveric valve) 3- Xenograft (Pig aortic valve) bovine Pericardium (Carpentier Edwards).
ⓑ Advantage Durable	ⓑ Disadvantages = Compls 1- Last 10-15 yrs (need reoperation) 2- Prosthetic valve endocarditis 3- Arrhythmia 4- Para valvular leak
ⓒ Disadvantages = Compls 1- Thrombosis (stuck valve) 2- Thromboembolism 3- Bleeding from over anticoagulants 4- endocarditis 5- Para valvular leak 6- arrhythmia	ⓒ Advantages 1- No need for anticoagulants 2- No Bleeding 3- No thrombosis 4- No thromboembolic manifs.
ⓓ Indication in people who can deal safely with anticoagulation - young men - Compliant to tt - educated - near by medical Facility	ⓓ Indication People whom anticoagulant not recommended - young ladies in child bearing age. - non-compliant pt. - pt away from medical facilities

Aortic dissection

- Def Tear in intima of aortic wall allows blood to enter and flow in false channel. The true (aortic lumen) and false (plane of dissection) channels are separated by dissecting membrane or flap that contains aortic media and intima.

- Classification (types)
  ⓐ Type A → Proximal dissection, involving ascending aorta, need immediate surgery
  ⓑ Type B → Distal dissection, beyond lt. subclavian artery involve descending aorta & stabilized medically and may not require immediate surgery.

- Staging ① Acute (1st 2 ws) ② subacute (1st 2 months) ③ chronic (after 2nd month)

- Diagnosis
  - 5 Ps (Pain, Pallor, Pulselessness, Paresthesia, Paralysis) & if site of Pain changing it indicate that the dissection is progressive
  - chest x-ray & Echo & CT scan & MRI & Aortography.

- Complications ① Spread to
  - Aortic valve ring → Acute aortic Regurge
  - carotid artery → unequal Carotid Pulse
  - subclavian " → " Pulse & BP
  - Coronary " → M-I
  - Renal " → Renal Pain & Hematuria

② Rupture → Hypotension & shock & Cardiac tamponade.

(Lung) (Pleura)

• Sup. Sulcus tumor (Pancoast tumor)

- Def Tumor at apex of lung
- C/F ① Pain in shoulder region
② Numbness, weakness of arm and hand, atrophy of hand muscles (tumor invade eg, T_1)
③ Horner syndrome
④ Paraplegia (spinal cord compression)
- Invs
  - ⓐ Radiological
    1- chest x-ray → mass on apex of lung
    ↳ diaphragmatic paralysis (raised C. pula)
    2- CT Scan → site, size, spread of tumor
    ↳ determine surgical approach
    3- CT brain for metastasis
    4- U/S Abdomen " "
    5- MRI more accurate
    6- Radionuclide bone scan
  - ⓑ Retrieval of cells for examination
    1- Sputum cytology: SCC most common
    2- pleural aspiration & cytology
    3- Bronchoscopy
    4- Transbronchial biopsy
    5- needle biopsy
    6- video assisted thoracoscopic surgery (VATS)
  - ⓒ Lab invs For assessment of general condition and operability
- Treatment
  - ⓐ Surgery
    1- Indications
    - early stages I, II
    - Selected pts é [illegible] stage III, IV
    - carcinoid tum[illegible]
    2- Types of p[illegible] resection
    - wedge or [illegible]mental resection
    - Lobectomy - Bilobectomy
    - Pneumonectomy
    - extended [illegible]l. resection
  - ⓑ Radiotherapy
  - ⓒ chemotherapy
  - ⓓ Palliation
    - Laser therapy or cryotherapy
    - Palliative resection

• Hydatid Cyst

- C/F 1- Hydatid [illegible] cysts account for 20% of ax
2- Breathlessness
3- cough
4- expectoration of watery fluid
5- Grape like [illegible]ins
- Invs
  1- chest x-ray, spherical well defined opacity (water lily appearance)
  2- CT chest
  3- Casoni test (intradermal test using cyst fluid as an Ag.
  4- Serological tests → immune electrophoresis (more reliable)
  → complement fixation
- TT
  ⓐ Enucleation and Capetenage
  endocyst is extruded intact and the lung cavity is obliterated by interrupted mattress sutures
  ⓑ Lobectomy if very large cyst

• pleural effusion

- Def abnormal collection of fluid in pleural space
- etiology
  - ⓐ Transudate causes
    1- Congestive heart failure
    2- Hepatic failure
    3- Renal failure
    4- Hypoalbuminemia (Nephrotic)
  - ⓑ Exudate causes
    1- Infections (Bact, T.B, Fungal, Parasitic, viral)
    2- Collagenic (R.A, SLE)
    3- malignancy (Lung cancer, Lymphoma, metastases)
    4- Pul. embolism
    5- Hemothorax & chylothorax (acute illness & ↑ T.G in pleura)
    6- Pseudochylothorax (chronic condition & ↑ cholesterol in pleural fluid)
    7- Abdominal disease (Pancreatitis, subphrenic abscess)
    8- Drug induced
    9- miscellaneous (esophageal perforation, radiation, Sarcoidosis, Meig syndrome)
    10- Idiopathic.
- C/F 1- small effusion → asymptomatic
2- Large e[illegible] → dyspnea, cough, chest pain, [illegible] COP, ↓ breath sounds, stony dullness in percussion
3- Signs & symptoms of underlying diseases.
- Invs ⓐ Lab → CBC, ESR
ⓑ chest x-ray → Blunting of costophrenic angle (early radiologic sign)
↳ indicate accumulation of ≥ 400 ml fluid
ⓒ CT scan prior to thoracocentesis to localize fluid.
ⓓ Thoracocentesis
1- Total Proteins > 3 g/dl → exudate & < 3 g/dl → Transudate
2- pleural protein/serum protein < 0.5 → Transudate
> 0.5 → exudate
3- pleural LDL / serum LDH > 0.6 → exudate
4- Glucose ↓↓ < 60 mg/dl → infection, malignancy
5- ↑↑ T.G → chylothorax > 110 mg
ⓔ pleural biopsy.
- TT
ⓐ Transudate, collagenic, drug induced
↳ Resolve following tt of the cause
ⓑ moderate and massive effusions.
↳ Drainage é thoracocentesis or intercostal tube.
ⓒ malignant pleural effusion
- pleurodesis (tube + sclerosant material)
- Surgery → videoscopic procedures
→ pleuro-peritoneal shunt
- Home tt é indwelling pleural catheter.

• Empyema

- Def: Pus in pleural space or involve empyema pleural space
- Etiology
1- Direct inoculation → Penetrating chest injuries & at surgery
2- Contamination from contiguous sources
- Bronchopleural infection.
- Rupture of lung abscess
- Transdiaphragmatic spread from subphrenic abscess
3- Hematogenous spread from distant sites
- Commonest isolated organism:
1- aerobic → G+ve: staph, strept
→ G-ve: proteus, H-influenza
2- anaerobic → Bacteroids.
- Compls: of chronic empyema
of untreated
1- Pul. fibrosis and chest wall deformities
2- Spontaneous drainage of pus through chest wall (empyema necessitatis)
3- Spontaneous drainage of pus through bronchial tree (Bronchopleural fistula)
4- Local spread of infection to pericardium or mediastinum
5- Distant infection (osteomyelitis)
6- Amyloidosis
- C/P
1- chest pain, purulent sputum, fever
2- Dullness, ↓ air entry
- Investigations
(a) Lab: ↑ ESR & ↑ WBCs
(b) Radiological
1- chest x-ray → pleural effusion
2- CT → pleural collection & Lung abscess
3- U/S → " "
(c) Thoracocentesis: Pus exudate
1- Gross Pathology &
2- microbiology
3- Biochemistry
- High Protein (exudate > 3g/dl)
- Low pH (< 7.2)
- High LDH (> 1000 IU/L)
- Low glucose (< 40 mg/dl)
- Treatment
(a) General: TT of underlying cause
(b) Antibiotics
(c) Surgery
1- closed intercostal tube drainage for early stage acute empyema & removed when daily drainage < 100 mL
2- open intercostal tube drainage if drainage of Pus continues inspite of good underwater seal drainage.
3- Rib resection for prevention of premature closure and prolonged drainage of empyema cavity.
4- Decortication to remove empyema and constricting pleural peel.
5- Thoracoplasty for persistent chronic empyema.

- Causes of failure of empyema drainage:-
1- non-dependent drainage
2- Tube inserted too
3- tube too small
4- peel too thick at drainage
5- Bronchopleural fistula
Presence of f-B.

A S Y E
5 R

Pneumothorax

- air in the pleural space
- Etiology
(a) Spontaneous
1- 1ry → Rupture of apical bleb & interstitial emphysema.
2- 2ry → associated with → COPD
→ Cystic fibrosis
→ Infections
→ Catamenial (associated with menstruation (focal pleural endometriosis)
→ miscelaneous (autoimmune diseases)
→ Tumors (Rupture of Lung cancer)
(b) Traumatic
1- Iatrogenic → (lung biopsy, central line insertion, mechanical ventilation)
2- penetrating or blunt chest trauma
3- Tension pneumothorax → presence of one way vulvalar mech or on positive pressure ventilation.
- C/P
1- dyspnea, chest pain, dry cough, severe resp-distress hypoxia, hypercapnia, acidosis)
2- ↓ air entry, hyperresonance
- Invs
1- chest x-ray → Jet black lung.
2- CT scan
- Compls
1- persistent air leak → more common & 2ry type.
2- Recurrence
3- Tension pneumothorax → alveolar air enters the pleural space but not resorbed at one way valve mech. Intrapleural pressure > atmospheric Pressure lead to Resp failure. (mediastinum shift & ↑ intrapul. shunt, ↓ COP, tachycardia)
Hemothorax
Pneumomediastinum
- Treatment
1- Observation if asymptomatic, Pneumothorax small.
2- chest tube drainage → re-expansion
3- Pleurodesis → to obliterate pleural space
4- Surgical indications
- Prolonged air leak
- Failure of lung to re-expand
- occupational hazard (in airline pilots/divers)
- Tension pneumothorax.
- Single large bulla.
- Bilat. Pneumothorax
- Hemopneumothorax
- Recurrent pneumothorax.

masses

@ Antrosup. mediastinum (4 Ts)

1- Thymic tumor
2- Thyroid tumor (Retrosternal)
3- Terratoma (Germ cell tumor)
4- T- Lymphoma.

ⓑ Middle mediastinum

1- Lymphadenopathy
2- Aortic aneurysm
3- Pericardial diverticulum.
4- Bronchogenic cyst.
5- Tracheal tumors
6- Parathyroid tumors
7- Neural tumors of phrenic nerves
8- morgagni hernia.

© Post mediastinum

1- neurogenic tumors → neurofibroma, neurofibrosarcoma, schwanoma, neuroblastoma, paraganglioma
2- meningocele
3- Esophageal tumors, diverticulae.
4- Hiatus hernia.
5- Theracic duct cyst & cystic lygroma
6- Extramedullary hematopoesis.
7- vertebral chordoma.
8- Paravertebral abscess.

Cysts

@ Ant mediastinum

1- Dermoid cyst.
2- Thymic cyst
3- cystic degeneration in retrosternal goiter
4- Lymphatogenic cyst

ⓑ Middle mediastinum

1- Bronchogenic cyst.
2- pericardial cyst.

© Post. mediastinum

1- Foregut cyst
2- Cystic degeneration in neurogenic cyst.
3- Cystic hygroma

most common mediastinal masses MCQ

1- neurogenic tumors (20%)
2- Lymphoma (15%)
3- Bronchogenic, pericardeal cysts (15%)
4- Germ cell tumors (15%)
5- Thymoma (15%)
6- Thyroid lesions (5%)
7- others 20%.

• mediastinitis

- etiology

1- median sternotomy wound infection
2- esophageal perforation
3- Local spread of infection.
4- Hematogenous, lymphatic spread.
5- Idiopathic

- C/P

Pain & dyspnea & fever & leucocytosis, sternal dehiscence.

- Invs

1- lab → leucocytosis.
2- chest x-ray & CT chest show
   - Broad mediastinum
   - mediastinal abscess & fluid level
   - Associated Pathology.
   - evidence of sternal dehiscence

- TT

1- systemic antibiotics
2- surgical debridment
3- Irrigation of mediastinum & Solution & antibiotics.
4- Drainage of mediastinal collections
5- Reclosure of sternum in sternal dehiscence.

• SVC syndrome

- etiology

1- malignant diseases → cancer lung (75%) & Lymphoma (10%) others (5%)
2- Benign diseases → fibrosing mediastinitis & Retrosternal goiter.
3- Iatrogenic caused → Thrombosis 2ry to Transvenous pacemakers or Central venous lines

- C/P

ⓐ Symptoms → Dyspnea, cough, face & arm swelling, chest pain, syncope, headache, confusion
ⓑ Signs → edema, prominent veins of head & neck & upper trunk & arm, cyanosis, plethora, papilledema, Horner's, vocal cord paresis.

- Invs

1- chest x-ray → mediastinal mass
2- CT chest & Iv contrast → level of obstruction
3- MRI
4- venography
5- Serum markers β-HCG & αfp → Germ cell tumor
6- Biopsy.

- TT

ⓐ medical → elevate head, O_2, diuretics, salt restriction, steroids, anticoagulants
ⓑ Radiotherapy
© chemotherapy
ⓓ Intravenous stents.
ⓔ Surgery → ByPass using venous autografts.
→ Resection, vascular reconstruction

• Flail chest

• Def occur when a segment of thoracic cage separated from rest of chest wall & paradoxical movement.
(at least two fractures per rib in at least two ribs)

• etiology
Severe blunt trauma

- Types
1- Ant
2- Poster (least dangerous)
3- lat
4- Flail sternum.

- CIP
1- Severe blunt trauma
2- Severe chest pain or rib fractures
3- Dyspnea, Tachypnea, Cyanosis.
4- Hypotension, tachycardia
5- Paradoxical movement of flail segment.
6- chest wall contusions ± surgical emphysema

- Pathophysiology
1- underlying Pul. contusion & ventilation perfusion mismatch. Hypoxemia (H+)
2- Pain of rib fractures → ↓ tidal volume, accumulate Secretions → Atelectasis → ↑ Pul. shunting,
3- Associated hemopneumothorax, cardiac trauma.
4- Hypoventilation of underlying lung from paradoxical respiration.
5- mediastinal flutter & kink of great vessels.
6- pendulum-like movement of dead space air

- Compls
1- Atelectasis
2- Surgical emphysema
3- Breathing difficulty
4- multiple rib fractures
5- unstable chest movement during respiration
6- ▬ Death.

- Invs
1- chest X-ray
2- CT scan
3- Blood gas
4- multislice CT scan (MSCT)

- TT
ⓐ General ABC
ⓑ Specific
1- oxygen inhalation
2- Pain relief → systemic analgesic (avoid opiate)
→ Intercostal nerve block.
→ epidural catheter
3- Pul toilet (+) clear secretions from airways and prevent atelectasis.
4- External chest wall stabilization by orthopaedic devices. (K-wires)
5- CPAP by mask.
6- IPPV (Intermittent +ve pressure ventilation) (when PaO_2 < 60mmHg & $PaCO_2$ > 60 mmHg)
7- Internal chest wall stabilization by K-wires.

A S C
(+) R

Indications of thoracotomy in chest trauma:-

ⓐ Resuscitation thoracotomy (ED)
To do open cardiac massage
ⓑ Emergency thoracotomy 2013
1- massive hemothorax (> 1500 cc or > 200 cc/hr for successive 3 hrs)
2- Cardiac tamponade
3- Major air leak
4- Great vessels injury.
5- Intrathoracic F.B
6- chest wall defect (traumatic Thoracotomy)
ⓒ Elective thoracotomy (late)
1- For diaphragmatic injuries
2- oesophageal injuries
3- intracardiac injuries.
4- Aortic rupture & false aneurysm
5- clotted hemothorax and empyema

Immediate life-threatening injury by chest trauma:-
(lethal six)

1- Airway obstruction.
2- Tension pneumothorax
3- open "
4- massive hemothorax
5- cardiac tamponade
6- massive flail chest

Potential life-threatening injury by chest trauma:-
(Hidden six)

1- Cardiac contusion.
2- Deceleration aortic injury
3- Tracheo-bronchial rupture.
4- Diaphragmatic rupture.
5- oesophageal perforation.
6- Pulmonary contusion.

* Deadly Dozen injuries
Immediate 6 = Potential 6
↓
12

• Achalasia

- Def failure of relaxation of lower esophageal sphincter in response to swallowing.

- C/P
young age & insidous onset & prolonged course & more in ♀
1- Progressive dysphagia to liquids and solids over several yrs (first for Fluids)
2- Regurgitation of undigested food esp in recumbent position.
3- No wt. loss & No dehydration.
4- Coughing or wheezing 2ry to aspiration
5- abnormal Resp. compls.

- Invs
1- Radiology → Plain chest x-ray
← normal or wide mediastinum & air fluid level in dilated esophagus.
← Absence of gastric air bubble.
2- Barium swallow → Tapering of distal esophagus (Bird's beak, pencil end) and dilated esophageal body & absence of oesophageal peristalsis
3- Endoscopy → Dilated esophageal body containing food residue.
4- esophageal manometry → Best.
incomplete relaxation of LES & swallowing and ineffective peristalsis of body of oesophagus

- compls
1- mucosal ulceration
2- Aspiration → Pneumonitis
3- Malignancy 2-3 % (SCC)

- management
(a) medical tt nitrate & Nifedipine (CCBs)
relax esophageal sphincter.
(b) Pneumatic dilatation
← Dilatation & bougies
← " ← Balloons
(c) Botulinum toxin
injected to LES → relax
(d) Surgery
esophago-cardiomyotomy → surgical Longitudinal section of outer Longitudinal and inner circular smooth muscle (out damage submucosa & mucosa.

- Pathophysiology & etiology
motility disorder of esophagus → degenerative nerve process & loss of ganglion cells in myentric plexus & ↓ vagal nerve fibers in wall of oesophagus → failure of relaxation of lower esophageal sphincter and ineffective peristalsis in body of oesophagus while Longitudinal muscle layers retains its normal thickness

• Corrosive esophageal injury (Post-Potash stricture:-

- classification
① first degree (superficial) burn: superficial mucosal hyperemia, mucosal edema ± superficial sloughing
② second degree (medium, transmucosal) burn:- submucosa, muscular layers are involved.
③ third degree (deep, full thickness burn) necrosis of entire wall of esophagus.

- phases & Types & C/P & TT

[a] Acute phase

• C/P
1- Pain, inability to swallow
2- Excessive salivation
3- Respiratory distress
4- Dehydration.
5- laryngitis, stridor (in severe cases)

• Invs
1- No instrumentation
2- No dilatation

• TT
1- oral, Parenteral antibiotics
2- Parenteral fluids
3- CST for edema
4- Tracheostomy life saving if stridor present.
5- No gastric lavage
6- No dye in tt.

[b] chronic phase

• C/P started 4-6 ws from incidence of potash ingestion.
1- Dysphagia 3- wt. loss.
2- Dehydration

• Invs Instrumentation (esophagoscopy) & esophagraphy.

• TT
1- esophageal dilatation
← if short stricture → dilated anterogradely
← If long stricture → dilated retrogradely
- gastrostomy feeding is required
- pt suspicious of having esophageal perforation following dilatation is treated conservatively
(i) stop oral intake
(ii) give massive Antibiotics
(iii) drain any collection (abscess/empyema)
(iv) institute gastrostomy feeding.

2- Retrosternal colon interposition
indicated if dilatation failed.
(A segment of transverse colon interposed bet. proximal esophagus and stomach.)

• Dysphagia

- Def Difficulty of swallowing

- Grades

Grade I : dysphagia for solids
Grade II : " " semisolids
Grade III : " " Liquids.
Grade IV " " own saliva.

- Invs

1- CBC → Anemia
2- esophageal manometry → evaluate motility of esoph. body.
3. Ambulatory 24 hr pH monitoring
4- " " " bile reflux "
5- Provocative test → Acid perfusion (Berstein test)
6- Esophagoscopy

Indications of Esophagoscopy ppt

ⓐ Diagnostic
1- Cancer oesophagus
2- Hiatal hernia
3- Achalasia
4- Identify cause of dysphagia and hematemesis.

ⓑ Therapeutic
1- Removal of F.B
2- Insertion of stent in cancer esophagus
3- Sclerotherapy in hematemesis in esophageal varices.
4- Dilatation of oesoph. stricture
5- laser therapy & Cryotherapy.

- Causes

(Causes of dysphagia dt lower 1/3 oesoph. lesion = DD)

ⓐ In lumen
1- F.B 2- Fungating mass

ⓑ In wall
1- stricture → Trauma (Corrossive, reflux esophagitis, Post sangestaken tube, Post injection sclerotherapy.
2- Benign tumor
3- Cancer esophagus
4- motility disorder → Achalasia, Diffuse oesoph. spasm, Diabetic neuropathy, Amyloidosis, Parasitic infection (chagas disease)
5- Barret's esoph.
6- Hiatus hernia
7- Post Potash esoph. stricture

ⓒ outside the wall
1- Paraesophageal hiatus hernia
2- Mediastinal or abdominal L.Ns enlergements
3. Iatrogenic tight repair of Hiatus hernia.

ⓓ other → Crohn's disease.

• GERD

A SX R ⑨

- Preventive mechs against GERD / reflux oesophagitis

1. Presence of intra-abdominal part of esoph.
   ↳ has higher pressure than thoracic esoph.
2. Sphincteric action of circular muscle of LES
3. Valve like effect of angulation of esophagogastric junction.
4. Pinch cock action of Rt. Crus of diaphragm maintain forward bent of oesophagastric junction
5. Rosette like fold of gastric mucosa at Cardia.
6. clearing effect of reflux by
   a) swallowing saliva (alkaline)
   b) erect Position
   c) Repeated esoph. peristalsis
   d) Gastro-duodenal emptying

- Surgical tt of GERD
  anti-reflux surgery.

Indications
1- Failure of maximal medical therapy for at least 6months.
2- Compls of GERD → Peptic ulcers, ulcerative esophagitis, Recurrent aspiration, Barrett esophagus
3- Associated lesion → gall bladder stone.

Operations
1- Nissen fundoplication (360°)
   ↳ Trans-abdominal approach.
2- Belsey mark IV 270°
   ↳ Trans-thoracic approach.
3- Hill gastropexy
   ↳ Trans abdominal
   ↳ suturing fundus to median arcuate lig overlying aorta (Post. gastropex)
4- Collis gastroplasty (esophageal lengthening) suturing of posteriorly sited fundus to Rt and lt. Crura to create Neo wrap.

Compls
1- Dysphagia
2- Gas bloat syndrome → inability to belch and Post prandial fullness (vagal nerve injury, aerophagia, delayed gastric emptying).
3- Technical failures.
   ← slipped nissen
   ← Breakdown of fundoplication.
   ← herniation into mediastinum
   ← esophageal or gastric perforation.

* Important Essay Qs :-

A SY C
(10) R

Q_1: Discuss Heart-lung machine (Def, indications, components, steps, myocardial preservation, compls)

Q_2: indications of thoracotomy in chest trauma?

Q_3: Define achalasia of cardia, describe Pathophysiology and discuss its management?

Q_4: management of Post-Potash stricture?

Q_5: compls of Aortic dissection,

Q_6: DD of mediastinal masses & Cyst?

Q_7: Give account on Pneumothorax?

Q_8: Give account on Empyema (Def, causes, Invs, TT)?

Q_9: DD of dysphagia at lower esophageal lesion?

Q_{10}: Pathophysiology of flail chest?

Q_{11}: Give account on flail chest (Def, c/p, Inv, tt)?

Q_{12}: Give account on mediastinitis?

Q_{13}: management of chronic empyema?
c/p, Invs, TT

Q_{14}: Short account on Hydatid cyst?

Q_{15}: Types of Prothetic cardiac valves & compls?

Q_{16}: Indications of CABG?

Q_{17}: steps of Heart lung machine?

Good Luck ..

2016

Q3: Complications of ECC?

- Brain
  - cerebral stroke
  - Neurocognitive defect
  - Psychological changes → depression, psychosis, obssession, sleep deprivation.
- Heart
  - M.I
  - low cop $
  - stone heart $
  - Arrhythmia.
- Lung
  - Atelectasis
  - ARDs
  - Post perfusion lung.
- GIT
  - Ileus "Paralytic ileus"
  - Stress ulcer
  - Acute Pancreatitis
- Kidney → Renal insufficiency.
- Vascular → Platelet dysfunction & immune suppression.

Q4: Indications of CABG "Coronary artery bypass graft surgery"?

1. Left main stem coronary stenosis.
2. Three-vessels disease.
3. In stent Stenosis or thrombosis after PCI.
4. Ischemic heart in diabetic patients.
5. Combined CABG and valve surgery.

Q5: Types of conduit used in CABG?

1- Internal mammary a. bypass

"Best conduit dt long term patency & secrete Nitric oxide.

2- Saphenous vein graft bypass

"most common used for revascularization of many diseased vessels" dt it is lengthy.

3- Radial a. bypass

Q6: Types of cardiac valves & complications?

Mechanical valve	Tissue valve
• Types 1- Ball and cage "starr-Edwards" 2- Mono leaflet valve 3- Bileaflet valve	• Types 1- Autograft 2- Homograft 3- Xenograft "pig's aortic valve"
• Adv Durable	• Disadv 1- last 10-15 yrs → need reoperation. 2- Endocarditis 3- Arrhythmia 4- Para-valvular leak
• Disadv 1- Thrombosis "stuck valve" 2- Thromboembolism 3- Bleeding from over anticoagulant. 4- Endocarditis 5- Arrhythmia 6- Paravalvular leak	• Adv → No need for anticoagulant So 1- No bleeding. 2- No thrombosis 3- No thromboembolic manifestations

Mechanical	Tissue
• Indication people who can deal safely with anticoagulation -Young men -educated -Compliant to tt - near by medical facility	• Indication People whom anticoagulat not recommended - young ladies in child bearing. age - non- compliant pt - pt away from medical facilities

Q9: Compli

Q7: Tetralogy of fallot (Fy) ?

1- VSD
2- Pul. Stenosis
3- over riding of aorta
4- Right ventricular hypertrophy.

if ASD present → Pentalogy of fallot.

Q8: Hydatid cyst (C/P, Invs, Rx) ?

• C/P
1- Hydatid Pul. cysts account for 20%.
2- Breathlessness.
3- Cough
4- expectoration of watery fluid.
5- Grape like skins

• Invs
1- chest x-ray → spherical well defined opacity (water lily appearance) cyst rupture.
2- CT chest
3- casoni test → interadermal test using cyst fluid as an Ag.
4- Serological tests → immuno electrophoresis

• TT Surgical TT
1- Enucleation and capetonage.
2- Lobectomy if very large cyst.

Q9: Complications of chronic empyema?
= " " untreated " ?

1- Pul. fibrosis and chest wall deformities.
2. Spontaneous drainage of pus through chest wall (empyema necessitatis)
3. Spontaneous drainage of pus through bronchial tree (bronchopleural fistula)
4- Local spread of infection to pericardium or mediastinum
5- Distant infection (osteomyelitis)
6- Amyloidosis

Q10: Management of chronic empyema?

Diagnosis
I- C/P → chest pain
→ purulent sputum
→ Fever
→ Dullness
→ ↓ air entry

II- Inv.
→ Lab → ↑ ESR → ↑ WBCs
→ Radiological
1- chest x-ray → Pleural effusion
2 CT → Lung abscess.
3- U/S → Pleural collections.
→ Thoracocentesis
pus examined for

- Gross Pathology
- Microscopic & culture sensitivity
- Biochemistry (exudative)
  - ↑ Protein (> 3g/dL)
  - ↑ LDH (> 1000 IU/L)
  - ↓ PH (< 7.2)
  - ↓ glucose (< 50 mg/dL

• TT

1- General → tt of underlying cause.
2- Antibiotics
3- Surgery → closed intercostal tube drainage. (→ for early stage)
→ open " "
→ Rib resection
→ Decortication (to remove empyema & thickened pleura)
→ Thoracoplasty.

لازم اكتبهاا indication بتاع كل واحدة

4- Causes of failure of empyema drainage
① Non-dependent drainage.
② Too far tube.
③ too small
④ too thick due to Late drainage
⑤ Bronchopleural Fistula.
⑥ presence of foreign body.

Q11: DD of Ant. mediastinal mass?

1- Dermoid cyst
2- Thymic cyst
3- cystic degeneration in retrosternal goiter.
4- Lymphatogenic cyst.
5- Teratoma
6- T- Lymphoma.

Q12: Give account on mediastinitis?

• etiology

1- Median sternotomy wound infection. → main cause
2- esophageal perforation.
3- local spread of infection.
4- Hematogenous, Lymphatic spread.
5- Idiopathic.

• C/P : Pain, dyspnea, fever, ↑↑ WBCs, sternal dehiscence

• Invs :
- Lab: ↑↑ WBCs.
- chest x-ray, CT chest.
1- Broad mediastinum
2- Mediastinal abscess ē fluid level
3- Associated pathology.
4- Evidence of sternal dehiscence.

• TT
1- systemic Antibiotics
2. Surgical debridment
3- irrigation of mediastinum ē solution & Anti biotics
4- Drainage of mediastinal collections.
5. Reclosure of sternum in sternal dehiscence

Q13: Flail chest ؟ ايش الصور اللي بدنا اياها

• Def: occur when a segment of thoracic cage separated from rest of chest wall ē Paradoxical movement.

2x2

at least two fractures per rib in at least two ribs

• etiology: Severe blunt Trauma

• Types: ① Ant ② Post ③ lat ④ Flail sternum.

• C/P:
1- Severe blunt Trauma
2- Severe chest pain of rib fractures.
3- Dyspnea, Tachypnea, Cyanosis.
4- Hypotension, Tachycardia.
5- Paradoxical movement of flail segment.
6- chest wall contusions ± surgical emphysema.

• Invs:
1- chest x-ray
2- CT scan chest.
3- Multislice CT
4- Blood gas analysis. ABG.

1- X-ray.
2- CT
3- ABG.
4- multi slice CT

• TT
① O_2 inhalation
② Pain relief
↳ systemic analgesic (No opioid)
↳ intercostal nerve block
↳ epidural catheter
③ Pul. toilet to clear secretions from airway
④ External chest wall stabilization

5- CPAP (Continous +ve Airway Pressure) by mask

6- Internal chest wall stabilization by (K) wires

Q14: Pathophysiology of flail chest?

- DeF: .....
- etiology ....
- Patho physiology: Hypoxemia (dt)

ventilation perfusion mismatch.

1- underlying Pul. contusion ē ventilation perfusion mismatch..
2- Pain of rib fractures → ↓ tidal volume, accumulate secretions → Atelectasis → ↑ Pul. shunting & ↓ Functional reserve capacity.
3- Associated hemopneumothorax or cardiac ~~trauma~~ trauma
4- Hypoventilation of underlying lung from paradoxical respiration.
5- Mediastinal flutter ē Kink of great vessels.
6- Pendulum-like movement of dead space air.

Q15: Indications of thoracotomy in thoracic trauma? مهمة

a) Resuscitation thoracotomy (ED thoracotomy)
To do open cardiac massage.-

b) Emergency thoracotomy ال لازم 2013

1- massive hemothorax (> 1500 cc or > 200 cc/hr for succenive (3hrs))
2- cardiac tamponade -
3- Major air leak -
4- Great vessel injury. -
5- Intrathoracic foreign body. -
6- chest wall defect (traumatic Thoracotomy) -

Traumatic thoracotomy

c) Elective thoracotomy (LATE) "late indications in chest trauma"

1- For diaphragmatic injuries
2- oesophageal injuries

3- Intracardiac injuries.
4- Aortic rupture ē false aneurysm.
5- [redacted] clotted hemothorax and empyema. → Clotted Hemothorax.

Q16: DD of dysphagia dt lower esophageal lesion?

= causes of " " " ⅓ " "?

I- In lumen → F.B

II- In wall
- ①- stricture → Trauma, Corrosive, reflux esophagitis / Post Sangestaken tube / Post injection sclerotherapy
- ②- Benign tumor
- ③- Cancer esophagus
- ④- Motility disorders → Achalasia of cardia / Diffuse oesoph. spasm.
- ⑤- Barret's oesophagus
- ⑥- Hiatus hernia
- ⑦- Post potash esophageal stricture.

III- outside the wall
- 1- Para esophageal hiatus hernia.
- 2- Mediastinal or abdominal L.Ns enlargement.
- 3- Iatrogenic Tight repair of hiatus hernia.

2 Hernia + Lymphnode.

Q17: Achalasia (Def, C/P, Invs, Rx)?

• Def: failure of relaxation of Lower esophageal sphincter in response to swallowing.

• C/P:
1- progressive dysphagia to liquids and solids over several yrs (first for fluids)
2- Regurgitation of undigested food esp in recumbent position.
3- [redacted] No wt. loss & No dehydration
4- Coughing or wheezing 2ry to aspiration.
5- abnormal Resp. Compls.

- Young age
- insidous onset
- Prolonged course
- more in ♀ Female

• Invs: 1- Radiology → plain chest x-ray
• normal or wide mediastinum ē air fluid level in dilated esophagus.
• Absence of gastric air bubble -
2- Barium swallow → Tapering of distal esophagus (Bird's beak, pencil end) and dilated or sigmoid esophagus and absence of gastric air bubbles.
3- Endoscopy → Dilated esophageal body containing food residue
4- Esophageal manometry → (Best)
↳ incomplete relaxation of LES ē swallowing and ineffective peristalis of body of oesophagus

• Compls
1- Mucosal ulcerations by irritation of retained blood.
2- Aspiration ῶ leads to Pneumonitis.
3- Malignancy [2-3%] (SCC at dilated site) squamous.

• Management
I- Medical tt → nitrate, CCBs → relax lower esophageal sphincter..

II- Pneumonetic dilatation
← Dilatation ē bougies
← " " Balloons

III- Botulinum toxin
injected into (LES) → relax

IV- Surgical tt
→ Esophago-cardio-myotomy → surgical longitudinal section of outer longitudinal and inner circular smooth muscle ēout damage submucosa, mucosa.

Q18: Aortic dissection (Def / class / staging)

- **Def**: Tear in intima of aortic wall allows blood to enter and flow in a false channel. The true (aortic lumen) and false (plane of dissection) channels are separated by dissecting memb. or flap that contains aortic media and intima.
- **class (stanford)** (Types)
  - **Type A**: proximal dissection, involving ascending aorta, need immediate surgery. (Immediate)
  - **Type B**: Distal dissection, beyond lt. subclavian artery involve descending aorta. & stabilized medically and may not require immediate surgery. (medical)
- **Staging**:
  - Acute → 1st [2 ws]
  - ~~chronic~~
  - subacute → 1st (2) months
  - chronic → after 2nd month.
- **Diagnosis** → 5 Ps (Pain / Pallor / Pulselessness / Parathesiae / Paralysis)
  - 1- Pain 2- Pallor 3- Pulselessness 4- Paraesthesia 5- Paralysis.
  - → Pain → severe, in chest, its location indicates Portion of aorta involved in dissection, changing location indicates that dissection is Progressing.

Q19: Empyema Def, causes, compls, TT...

- **Def**: Pus in pleural space, may be localized or involve entire pleural space.
- **etiology**:
  1. Direct inoculation → Penetrating chest injuries or at surgery
  2. Contamination from contiguous sources
     - ← Bronchopul. infection
     - ← Rupture of lung abscess

aerobic — Bacteroids
G+ve → strept, staph
G-ve → proteus, H.influenza, coliforms

- TT ..... → ++ In surgery
  1) closed intercostal tube drainage → early stage acute empyema & removed when daily drainage < 100 ml
  2) open intercostal tube drainage → if drainage of pus continues inspite of good underwater seal drainage.
  3) Rib Resection → for prevention of premature closure and allow prolonged drainage of empyema cavity.
  4) Decortication → To remove empyema and constricting pleural peel.
  5) Thoracoplasty → for persistent chronic empyema

- Causes of failure of empyema drainage
  1) Non-dependent drainage
  2) tube inserted too far
  3) tube too small
  4) Peel too thick dt late drainage
  5) Bronchopleural fistula.
  6) Presence of foreign body.

Q20: Pneumothorax ?

- Def : Air in Pleural space.
- etiology: @ spontaneous
  1- 1ry → Rupture of apical bleb
  2- 2ry → associated ē
    - chronic obstructive lung disease
    - cystic fibrosis
    - Infection → cavitation non-specific bacte

① spontaneous
② catamenial
③ miscellaneous (14)

- Catamenial → associated ē menstruation (focal pleural endometriosis)
- Miscellaneous → associated ē many connective tissue and autoimmune diseases.

(b) Traumatic

1- Iatrogenic → lung biopsy, central line insertion, barotrauma (mechanical ventilation)

2- Penetrating or blunt chest trauma → Disruption of tracheobronchial tree, Pul. Parenchyma, esophageal perforation, open pneumothorax.

* Any type of closed pneumothorax may be simple or Tension Pneumothorax.

• Compls

1- Persistent air leak → more common ē 2ry pneumothorax and denotes bronchopleural fistula

2- Recurrence

3- Tension Pneumothorax → Alveolar air enters the pleural space, but not resorbed because of one-way valve mechanism.

4- Hemothorax

5- Pneumomediastinum

• TT

(a) observation → if pt is asymptomatic and pneumothorax is small (<20%) ē no evidence of radiologic Progression.

(b) chest-tube drainage → To ensure re-expansion of lung

(c) Pleurodesis → To obliterate pleural space after lung expansion.

(d) surgery → open or VATs to resect blebs or bullae

Indications of surgery in Pneumothorax

... مدرسة بيي سؤال انتظرل لرجعه ↓

① prolonged air leak
② failure of lung Re expan
③ Tension Pneumothorax.

1- Prolonged air leak
2- failure of lung to re-expand
3- occupational hazard (in air line pilots, divers)
4- Tension pneumothorax
5- single large bulla
6- Bilat. pneumothorax.
7- Hemo pneumothorax
8- Recurrent pneumothorax.

Q_{21}: DD of mediastinal masses & cyst ?

Ant

- Contain Thymus, L.Ns and fat
- masses, cyst

(4 T) ...

1- Thymic Tumor/cyst (MCA most, common)
2- Thyroid (Retro...
3- Teratoma
4- T. lymphoma

Post

- contains esophagus, descending aorta, azygous veins, thoracic duct, Sympathetic chain, L.Ns
- masses, cyst

1- Neurogenic tumors (MCA) ← sympathetic ganglia as neuroblastoma
2- Meningocele
3- esophageal tumors
4- Hiatus hernia
5- Thoracic duct cysts
6- Extramedullary hematoposis
7- Cystic hygroma
8- Cystic degeneration in neurogenic cyst
9- foregut cyst

Middle

- Contains Heart & Pericardium & SVC & IVC & ascending aorta & arch of aorta, trachea & phrenic, vagus
- masses, cyst

1- Branchogenic cyst.
2- Pericardial "
3- lymphadenopath
4- Aortic aneurys
5- Tracheal Tum
6- parathyroid cy
7- Morgagni hernia.

Q22: Compls, Rx of flail chest?

(16)

1- Atelectasis
2- Surgical emphysema
3- Breathing difficulty
4- Death.
5- Multiple rib fractures
6- unstable chest movement during respiration

+ C/P

(a) general management of Trauma

1- Resuscitation phase

- **Airway**
  - ← suction
  - ← oral or nasal Airway
  - ← EndoTracheal tube
  - ← cricothyroidotomy
  - ← Tracheostomy
  - ← Bronchoscopy
- **Breathing**
  - ← O_2 inhalation
  - ← close chest wall defects (open pneumothorax)
  - ← expand lung by intercostal tube drainage (ICTD)
  - ← stabilize chest wall
  - ← Blood gas analysis
  - ← Mechanical ventilation
- **Circulation**
  - ← large-bore venous access
  - ← CVP line
  - ← volume resuscitation
  - ← stop bleeding
  - ← Exclude cardiac Tamponade.

(b) Speafic management

.....

(c) Indications of mechanical ventilation

$P_aO_2 < 60$ mmHg

$P_aCO_2 > 60$ mmHg

Q23: Rupture diaphragm: MCQ (17)

- Acute → early → Trans-abdominal repair (laparotomy) to deal & associated intra-abdominal injuries.
- chronic → late → Trans-thoracic repair (thoracotomy)
  - Reduce hernia
  - Repair diaphragmatic Tear
  - free adhesions bet abdominal viscera and intrathoracic structures.

Q24: Cardiac injury ; MCQ

- etiology → Blunt → contusion.
  - Penetrating Trauma
- c/p → Beck's triad: Hypotension / congested neck veins / distant heart sounds
  - → Pulsus Paradoxus
  - → Kussmaul's Sign
- Inv → Echo
- manage → General .....
  - Specific: emergency & thoracotomy
    - " pericardiocentesis.

Q25: Dysphagia مهم جداً جداً

- Def : Difficulty in swallowing
- Grades: Grade I → dysphagia for solids.
  - " II → " " Semisolids
  - " III → " " Liquids
  - " IV → " " own saliva
- Invs:
  1. CBC → Anemia
  2. Esophageal manometry → evaluate motility of esophageal body.
  3. Ambulatory (24) hr pH monitoring
  4. " " " bile reflux "
  5. Provocative Test : Acid perfusion (Berstein test)
  6. Esophagoscopy

Q26: Pathophysiology (eTiology) of Achalasia?

motility disorder of esophagus.

degenerative nerve process & loss of ganglion cells in myenteric plexus & ↓ of vagal nerve fibers in wall of esophagus → failure of relaxation of lower esophageal sphincter (LES) and ineffective peristalsis in body of esophagus. & Hypertrophy of circular muscle layer of esophagus while longitudinal muscle layers have normal thickness..

Q27: Corrosive esophageal injury? (Diagnosis, tt of Post-Potash stricture)

- Pathology → Acute necrotic phase
  → ulceration necrotic phase.
  → chronic phase (cicatrization and stricture formation).

→ Necrosis → ulceration → Cicatrization.

- Types

Acute	chronic
C/P - Pain, inability To Swallow - Excessive salivaTion - Resp. distress. - Dehydration. - laryngitis, sTridor in severe cases.	C/P started (4-6) ws from incidence of Potash ingestion - Dysphagia - Dehydration - wt. loss.
Invs No instrumentation. No dilatation.	Invs Instrumentation
Rx 1- oral, parenTeral AnTibioTics 2- Parenteral fluids. 3- CST for edema. 4- Tracheostomy life saving if stridor present. 5- No gastric lavage 6- No dye in Rx.	Rx 1- Esophageal dilatation • if short stricture → dilated anterogradely • if long stricture → dilated retrogradely. Gastrostomy feeding is required →

pt suspicious of having esophageal perforation following dilatation is (tt) Conservatively

- stop oral intake
- give massive Antibiotics
- drain any collection (abscess & empyema)
- institute gastrostomy feeding.

2- Retrosternal colon interposition indicated if failed dilatation

---

Q28: Compls of Aortic dissection?

- **Spread to:-**
  1) Aortic valve ring → Acute Aortic regurge.
  2) Carotid artery → unequal carotid pulsation.
  3) Subclavian " → " Pulse & BP
  4) Coronary " → M.I.
  5) Renal " → Renal Pain / Hematuria

- **Rupture**
  ① Hypotension.
  ② Shock.
  ③ Cardiac tamponade.

Q29: Steps of (Heart lung machine)

1- Mid sternotomy.
2- Heparin ..... page 20
3- Canulae inserted into aortic arch, SVC, IVC
4- Reservoir .....
5- oxygenator ....
6- Roller pump ....
7- Filters → prevent passage of micro-emboli.
8- Aortic Cross clamp → ischemia & force heart to stop beating
9- Cardioplegia.
10- Protamine sulfate at end ---..Page 20..

لا تنسانا من صالح الدعاء